

Seat No: \_\_\_\_\_

Enrollment No: \_\_\_\_\_

**PARUL UNIVERSITY**  
FACULTY OF IT & COMPUTER SCIENCE  
PARUL INSTITUTE OF COMPUTER APPLICATION  
BCA/ITCA2019-20 Remedial Mid Semester Examination

Semester: 1

Subject Code: (05191101/05391101)

Subject Name: (Basic Mathematics)

Date: (19/09/2019)

Time: (2hr)

Total Marks: 40

Instructions:

1. Figures to the right indicate full marks.
2. Make suitable assumptions wherever necessary.

**Q.1 Answer the following.**

[10]

(a) 1) Let  $A = \{a, b, c, d, e, f\}$ . Insert the appropriate symbol  $\in$  or  $\notin$  in the blank space.

[3]

a    A

2) Write the following set in the roster/tabular form.

$$A = \{x : x \in W, x \leq 5\}$$

3) Identify following set is finite or infinite.

$$C = \{x : x \text{ is a natural number}\}$$

(b) 1) Two matrix can be added/subtracted only when order of both matrix is \_\_\_\_\_

[7]

- a) different      b) same      c) not depend on order      d) none of these

2)  $A \cap A$  \_\_\_\_\_

- a)  $\emptyset$       b) A      c) U      d) None of these

3) If two rows(column) of a determinants are identical then value of determinant is \_\_\_\_\_

- a) 0      b) 1      c) -1      d) None of these

4) If set p has 2 elements, set Q has 3 elements and set R has 2 elements, then How many elements does the Cartesian product set  $P \times Q \times R$  will have..?

- a) 12      b) 24      c) 20      d) 8

5) A diagonal matrix having all diagonal elements are 1, called \_\_\_\_\_

- a) Unit matrix      b) Diagonal matrix      c) Scalar matrix      d) None of these

6) IF matrix A is of order  $2 \times 3$ , and matrix B is of order  $3 \times 2$ , then what is the order Of matrix AB?

- A)  $2 \times 2$       b)  $3 \times 3$       c)  $2 \times 3$       d)  $3 \times 2$

7) A set containing no element is called \_\_\_\_\_

- a) empty set      b) Singleton set      c) Finite set      d) None of these

**Q.2 Answer the following. (2 or 3 mark questions)**

(a) 1) If  $A = \begin{bmatrix} 2 & 3 & 4 \\ 4 & 3 & 1 \\ 1 & 2 & 4 \end{bmatrix}$   $B = \begin{bmatrix} 1 & 2 & -1 \\ 0 & -2 & 0 \\ 2 & 2 & 6 \end{bmatrix}$ , then compute the following

[4]

- i)  $A + B$       ii)  $A - B$

2) Compute the value of following determinant

$$\begin{vmatrix} 1 & 0 & -4 \\ -2 & 2 & 5 \\ 3 & -1 & 2 \end{vmatrix}$$

(b) 1) There are 35 students in art class and 57 students in dance class find the number of students who are either in art or in dance class. [6]

1) When two classes meet at different hours and 12 students are enrolled in both Activities.

2) when two classes are meet at the same time.

2) If  $A = \{1,4\}$ ,  $B = \{2,3\}$ ,  $C = \{3,5\}$ , find  $(A \times B) \cap (A \times C)$

Q.3 Attempt any TWO. [10]

1 Find the inverse of  $A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & 2 & 3 \\ 3 & 1 & 2 \end{bmatrix}$  [5]

2 Use Cramer's Rule to solve: [5]

$$2x + y - z = 3$$

$$x + y + z = 1$$

$$x - 2y - 3z = 4$$

3 Prove following statements of De Morgan's law for complement. [5]

1)  $(A \cup B)' = A' \cap B'$

2)  $(A \cap B)' = A' \cup B'$

Q.4 Answer the following. [10]

(a) If  $A = \begin{bmatrix} 6 & 1 \\ 2 & 3 \end{bmatrix}$   $B = \begin{bmatrix} 1 & 8 \\ 7 & 10 \end{bmatrix}$  Find the matrix X such that  $3A + 5B + 2X = 0$  [5]

(b) If  $A = \begin{bmatrix} 3 & -3 & 0 \\ 6 & 3 & 9 \\ 12 & 3 & 24 \end{bmatrix}$   $B = \begin{bmatrix} 2 & 3 & 0 \\ 6 & -9 & 3 \\ 3 & 3 & -3 \end{bmatrix}$  [5]

Verify that  $(AB)' = B'A'$

OR

(b) If  $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ -1 & -2 & -3 \end{bmatrix}$ , show that  $A^2 = 0$  [5]

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